



The
Patent
Office

PRIORITY DOCUMENT

SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

PCT/GB98/01586
09/446232

REC'D 22 JUL 1998
The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP9 1RH

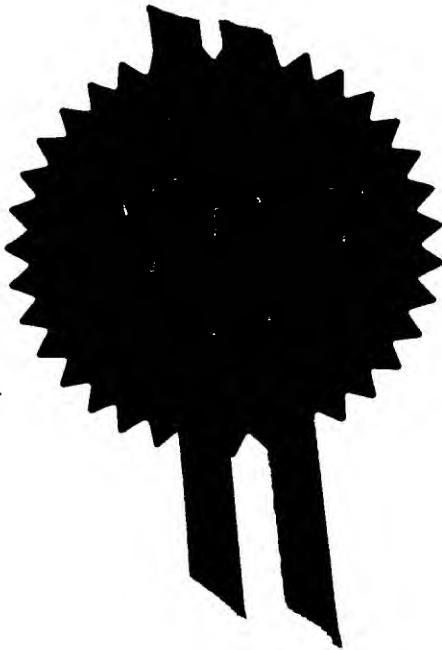
#1
6-28-02

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.



Signed

Dated

29 June 1998



Request for grant of a patent

(See notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

THE PATENT OFFICE

19 JUN 1997

RECEIVED BY POST

19 JUN 97 E282915-1 D01886
PO1/7700 25.00 - 9712815.1

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference

RD 407

2. Patent application number

(The Patent Office will fill in this part)

19 JUN 1997

9712815.1

3. Full name, address and postcode of the or of each applicant (underline all surnames)

BRITISH-AMERICAN TOBACCO CO. LTD
MILLISANIC
KNOWLE GREEN
STAINES
MIDDLESEX
TW18 1DY
ENGLAND & WALES 0723340502

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

SMOKING ARTICLE AND SMOKING MATERIAL THEREOF.

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

MR M.R. WATFORD / MR. K.J.H. MacLean
BRITISH-AMERICAN TOBACCO CO. LTD
PATENTS DEPARTMENT
REGENTS PARK ROAD
SOUTHAMPTON
SO15 8TL

Patents ADP number (if you know it)

C5819198204

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

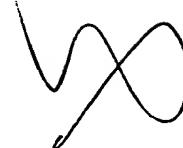
Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form.
Do not count copies of the same document

Continuation sheets of this form

Description

12 PAGES X 2



Claim(s)

Abstract

Drawing(s)

10. If you are also filing any of the following, state how many against each item.

Priority documents

—

Translations of priority documents

—

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

—

Request for preliminary examination and search (Patents Form 9/77)

—

Request for substantive examination (Patents Form 10/77)

—

Any other documents
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature M.L.Warford

Date 18.6.97

12. Name and daytime telephone number of person to contact in the United Kingdom

Mrs M.L.Warford - 01703 793730

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- e) Once you have filled in the form you must remember to sign and date it.
- f) For details of the fee and ways to pay please contact the Patent Office.

Smoking Article and Smoking Material therefor

The subject invention relates to smoking articles, cigarettes for example, and smoking material therefor.

The patents literature contains many proposals for smoking materials for use in place of conventional cut tobacco cigarette filler.

It is an object of the subject invention to provide new smoking materials which provide for mainstream smoke which although containing low levels of tobacco derived components, is fully acceptable to the consumer.

The subject invention provides a smoking material comprising a non-polyol aerosol generator, up to 20% by weight tobacco, binder at not more than 20% by weight and not less than 30% by weight inorganic filler.

Triethylene glycol diacetate ('TEGDA'), glycerol triacetate ('triacetin') or glycerol diacetate ('diacetin'), for example, can be used as the non-polyol aerosol generator either individually or in combination. As is well known to those skilled in smoking article science and technology, TEGDA and triacetin are substances with an established use as plasticisers (bonding agents) for cellulose acetate cigarette-filter tow. It was thus surprising to find that these substances and similar substances, when used as aerosol generating substances in smoking materials according to the subject invention, provide aerosols in mainstream smoke which smokers register as very acceptable.

Non-polyol aerosol generator is usefully present in smoking materials of the subject invention at levels in a range of about 5% to about 30% by weight. More usually the range will be about 8% to about 20% by weight.

Total aerosol generator can include a polyol aerosol generator, such as for example one or more of glycerol, propylene glycol and triethylene glycol.

Smoking materials according to the subject invention can, as will be readily appreciated by those skilled in the art, be fabricated by slurring the components, in fine particulate form, with water and casting the slurry to sheet form on a band or wire sheet-forming machine or on a heated drum. An alternative is to feed a mixture of the components, together with water, to an extruder. The product of casting or extrusion is suitably cut and shredded to provide smoking material of particulate form.

If the components used to provide the smoking material do not include tobacco, then advantageously the smoking material, in particulate form, is blended with particulate tobacco. In such case, the smoking material expediently accounts for at least about 30% by weight of the blend. Suitably, the smoking material will account for the majority, by weight, of the blend. The tobacco in the blend may be expanded tobacco.

A class of substance suitable for the selection therefrom of binder in smoking materials according to the subject invention is the alginates. Sodium alginate has been found to be advantageous. Other suitable binder substances are

celluloses or modified celluloses, hydroxypropyl cellulose for example, starches or modified starches and natural gums.

Suitable substances for use as inorganic filler are calcium carbonate, perlite, vermiculite, diatomaceous earth, colloidal silica, magnesium oxide, magnesium sulphate, magnesium carbonate or other low density inorganic filler materials known to those skilled in the art.

In smoking materials according to the subject invention inorganic filler is preferably present at a level of at least about 35%, preferably at least about 40% and more preferably at least about 45% by weight.

Smoking materials according to the subject invention may comprise one or more mechanical stabiliser or strengthening materials, examples being cocoa, sugar and fibre, paper fibre for instance. Expansion medium, such as starch, and high fat or high oil materials, such as cocoa butter or olive oil, corn oil, for example, may also be advantageously included.

Smoking material according to the invention may be used in a conventional smoking article, either blended with another smoking material, which may be tobacco material, or not or in a coaxial arrangement, for example.

According to a second aspect of the subject invention a smoking article comprising a smokable rod and a filter, said rod comprising a core and an outer part, said core comprising a first particulate smoking material and a first cigarette paper wrapper enwrapping said first smoking material and said outer part comprising a second particulate smoking material disposed annularly about said core and a second cigarette paper wrapper

enwrapping said second smoking material, wherein either of said first or said second smoking material comprises a non-polyol aerosol generator, up to 20% by weight tobacco, binder at not more than 20% by weight and not less than 30% by weight inorganic filler.

Preferably the second smoking material is smoking material according to the invention.

As will be observed, one of the said smoking materials of the smoking article of the second aspect of the subject invention is as per the smoking material of the first above recited aspect of the subject invention. The smoking material of the first above recited aspect of the subject invention may be present in both the first smoking material and the second smoking material of the smoking article above.

Preferably the said second smoking material of the smoking article is as per the smoking material of the first above recited aspect of the subject invention.

Expediently, the first smoking material is cut tobacco filler, suitably cut lamina filler.

Much by preference, in smoking articles in accordance with the subject invention both the core and the outer part of the smokable rod extend over the full length of the rod. It is much by preference too for the core to be disposed coaxially of the rod.

In a third aspect of the invention, there is provided a smoking article comprising a smokable rod and a filter, the smokable rod comprising smoking material and the filter comprising filtration material provided with an elutable

aerosol generator which is a polyol and/or a non-polyol aerosol generator, the aerosol generator being elutable from the filter upon smoking of the smoking article to enhance the aerosol provided from the smoking material.

The smoking article may be of a coaxial arrangement or non-coaxial arrangement.

Advantageously the smoking material comprises an aerosol generator, a binder and an inorganic filler, and is more advantageously comprised of a non-polyol aerosol generator, up to 20% by weight tobacco, binder at not more than 20% by weight and not less than 30% by weight inorganic filler. Alternatively the smoking material may comprise one or more of the aerosol generating means or aerosol generating fuel sources of our co-pending application filed on 6 September 1995 under International Patent Application No. PCT/GB 95/02110. As a further alternative, the smoking material may comprise conventional cut tobacco leaf material.

The aerosol generator may be a polyhydric alcohol, an ester, a high boiling point hydrocarbon, glycerol, propylene glycol, methylene glycol, methyl citrate, triacetin or diacetin, either alone or in combination.

In a smoking article of an exterior circumference conventional for a cigarette, i.e. c.25mm, the exterior circumference of the said core is suitably about 17mm.

EXAMPLE 1

A smoking article, a cigarette, exemplary of the subject invention comprised a core of approximately 17mm circumference,

which core consisted of cut lamina filler conventional for ultra-slim cigarettes, such, for example, as the ultra-slim cigarette made by British American Tobacco (Germany) under the brand name CAPRICE, and a wrapper of conventional cigarette paper. The outer part of the cigarette disposed annularly about the core consisted of a blend of 50% by weight of expanded lamina tobacco and 50% by weight of a smoking material according to the subject invention enwrapped in an outer wrapper of low sidestream cigarette paper made by Glatz Inc. under the experimental designation GNS40MV. The expanded tobacco had been expanded by the well known Dry Ice Expanded Tobacco (DIET) tobacco expansion process. The smoking material according to the subject invention, which had been band cast and then cut and shredded, had a percentage composition by weight as follows.

TEGDA	2.6
Glycerol	6.5
Conventional Tobacco Blend (ground)	19.8
Sodium Alginate	9.9
Chalk	48.3
Cocoa	6.4
Demerera Sugar	3.0
Paper Fibre	3.5

The core and the outer part were lengthwise coterminous.

The cigarette according to the subject invention further comprised a conventional ventilated fibrous cellulose acetate filter.

EXAMPLE 2

A second exemplary smoking material in accordance with the subject invention is of a percentage composition by weight as follows.

TEGDA	6
Glycerol	6
Conventional Tobacco Blend (ground)	20
Sodium Alginate	10
Chalk	51
Cocoa	4
Demerera Sugar	3

This second smoking material in cut and shredded form could, for example, be blended with a conventional cut tobacco cigarette filler. The ratio in the blend of smoking material to filler might, for instance, be 7:3. The blend could be fed to a cigarette making machine to provide cigarette rod comprising the blend and a wrapper of conventional cigarette paper or a low sidestream paper, for example.

EXAMPLE 3

A third exemplary smoking material in accordance with the subject invention is of a percentage composition by weight as follows.

TEGDA	10
Glycerol	4
Sodium Alginate	8
Chalk	78

This third smoking material in cut and shredded form could, for example, be blended with conventional cut tobacco filler in a ratio of, for instance, 4:6 and used for the provision of cigarette rod.

EXAMPLE 4

The following three smoking material formulations were prepared for comparison. The compositions are percentage by weight of each component.

TABLE 1

Sample Number

1 2 3

	1	2	3
Triacetin	0	9.6	4
Glycerol	8.6	0	4
Conventional Tobacco Blend (ground)	20.3	20.1	20
Sodium Alginate	8.1	8	8
Fibre	1	1	1
Perlite	62	61.3	63

Smoke Deliveries

Puff No.	3.4	5.3	4.0
TPM (mg/cig)	7.5	5.3	7.6
Water (mg/cig)	2.7	0.8	2.1
Nicotine (mg/cig)	0.19	0.1	0.2
Glycerol (mg/cig)	1.11	n/m	n/m
Triacetin	n/m	2.03	n/m
NFDPM (mg/cig)	4.59	4.36	5.35
NAFDPM (mg/cig)	3.48	2.33	n/m

NAFDM = Nicotine, aerosol free dry particulate matter
 (aerosol being glycerol or triacetin).

NFDPM = Nicotine free dry particulate matter.

n/m = Not measured

The cigarettes were smoked under standard machine smoking conditions of 35cm³ puff of 2 seconds duration taken every minute to a butt length of 35mm.

EXAMPLE 5

In order to observe the influence of an aerosol generator held on a filter element against a smoking article having a standard fibrous cellulose acetate filter the mixed glycerol and triacetin sheet (Sample 3 of Example 4 above) was used in smoking articles with an aerosol generator in the filter at various levels. The cigarettes were of 84mm length, c.8mm diameter with a 27mm filter element and were smoked under standard machine smoking conditions to 35mm butt length. The aerosol generator on the filter was propylene glycol (PG).

TABLE 2

	Sample Number				
	4	5	6	7	8
PG on filter (mg)	0	5	10	20	30
<u>Smoke Deliveries</u>					
Puff Number	4	4	4	3.75	4
TPM (mg/cig)	7.6	5.7	7.56	8.4	11.6
Water (mg/cig)	2.05	1.35	1.33	1.58	2.23
Nicotine (mg/cig)	0.20	0.17	0.17	0.13	0.15
NFDPM (mg/cig)	5.35	4.18	6.06	6.69	9.22
<u>% Smoke Composition</u>					
Water (%)	27.0	23.7	17.6	18.8	19.2
Nicotine(%)	2.6	3.0	2.2	1.5	1.3

It can be seen that the presence of additional aerosol generator dilutes the smoke constituents and provides a useful means for reducing the smoke delivery levels of various smoke components.

EXAMPLE 6

Other formulations of smoking material according to the invention were made according to Table 3. Additional materials included starch, oils and alkaline water. In Sample 58a a 0.1M solution of sodium carbonate was made up and added to the dry mixture instead of the usual water, until the required pH was reached. The compositions are percentage by weight of each component.

TABLE 3

Sample No.	Tobacco	sodium Alginat e	sugar	Cocoa	Chalk	Glycerol	Tegda	Triacetin	Other Components
2a	20	10	15	4	39	6	6	6	
3a	20	10	3	20	35	6	6	6	
5a	20	10	3	4	37	6	20	6	
7a	20	10	3	4	51	6	-	6	
8a	20	10	3	4	37	6	-	20	
10a	20	10	3	4	51	-	12	-	
11a	18	9	3	4	56	-	10	-	
12a	20	10	3	4	41	6	6	-	10 (Paper Fibre)
16a	20	10	3	-	45	6	6	-	10 (Starch)
17a	20	10	3	-	45	6	6	-	10 (Cocoa Butter)
26a	20	25	3	4	36	6	6	-	
34a	20	10	3	-	45	6	6	-	10 (Corn oil)
39a	20	10	-	-	55	-	-	15	
41a	20	10	3	4	-	6	6	-	51 (Perlite)
42a	20	10	3	4	26	6	6	-	25 (Perlite)
51a	20	10	3	-	30	6	6	-	15 (Cooked Starch)
52a	20	10	-	-	55	-	-	-	15 (Olive Oil)
58a	20	10	3	4	51	6	6	-	pH=9.3



A.J.

PCT/GB 98/01586

BRITISH AMERICAN TOBACCO
(INVESTMENTS) LTD

29 MAY 1998